

REMARKS

Examiner P. Perkins is thanked for the thorough examination and search of the subject Patent Application. The Examiner is thanked for allowing Claims 8-15 and 23-25 of the second embodiment of the invention.

All Claims are believed to be in condition for Allowance, and that is so requested.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 1-4 and 16-19 as being unpatentable over Jang et al in view of Sahota is requested in accordance with the following remarks.

It is agreed that both Jang et al and Sahota teach methods of filling shallow trench isolation using HDP-CVD oxide. However, both Jang et al and Sahota use CMP steps for planarizing the oxide layer. It is an object of Applicants' invention to eliminate the use of a polishing process such as CMP (see the discussion bridging pages 1 and 2). Claim 16 at lines 26-27 claims that the etch stop layer and oxide residues are removed "without a polishing process". This is clearly not taught or suggested in either of the references.

Furthermore, the first embodiment of the invention, claimed in Claims 1 and 16, claims that during the sputtering step of the HDP-CVD process, the oxide layer within the isolation trenches is disconnected from the oxide layer overlying the etch stop layer. (e.g. Claim 1, lines 19-21. See also top of page 9 of the Specification and Fig. 4). This is a critical step, allowing

the removal of the remaining oxide overlying the etch stop layer during the subsequent steps without using a polishing process. Neither of the references teach or suggest disconnecting the oxide layer within the trenches from the oxide layer overlying the etch stop layer.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 1-4 and 16-19 as being unpatentable over Jang et al in view of Sahota is requested in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 5, 6, 20, and 21 as being unpatentable over Jang et al in view of Sahota and further in view of Fu et al is requested in accordance with the following remarks.

It is agreed that Fu et al discloses removing the silicon nitride layer using hot phosphoric acid. Fu et al as well as the other references first uses CMP to remove the oxide layer outside of the trenches (col. 3, lines 28-32). None of the references teach or suggest removing the oxide residue without using a polishing process as claimed in Claims 20 and 21. None of the references teach or suggest disconnecting the oxide layer within the trenches from the oxide layer overlying the etch stop layer during the sputtering step of the HDP-CVD process.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 5, 6, 20, and 21 as being unpatentable over Jang et al in view of Sahota and further in view of Fu et al is requested in accordance with the remarks above.

Reconsideration of the rejection under 35 U.S.C. 103 of Claims 7 and 22 as being unpatentable over Jang et al in view of Sahota and further in view of Hao et al is requested in accordance with the following remarks.

Hao et al also discloses a CMP process for removing the oxide layer outside of the trenches, although they do teach that etching back may be used. Hao et al does not teach or suggest disconnecting the oxide layer within the trenches from the oxide layer overlying the etch stop layer during the sputtering step of the HDP-CVD process as claimed in Applicants' invention.


Reconsideration of the rejection under 35 U.S.C. 103 of Claims 7 and 22 as being unpatentable over Jang et al in view of Sahota and further in view of Hao et al is requested in accordance with the remarks above.

It is agreed with the Examiner that the prior art made of record and not relied upon, Lim et al, is pertinent to the second embodiment of Applicants' disclosure. This reference is commonly assigned with the present invention.

Allowance of all Claims is requested.

It is requested that should Examiner Perkins not find that the Claims are now Allowable that the Examiner call the undersigned at 765 4530866 to overcome any problems preventing allowance.

Respectfully submitted,

A handwritten signature in cursive script, reading "Rosemary L. S. Pike". The signature is written in black ink and is positioned above the printed name.

Rosemary L. S. Pike. Reg # 39,332